IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A system for estimating quantities of pollutant compounds emitted in [[the]] exhaust gases of a diesel engine of a motor vehicle, comprising means for regenerating a solid particulate filter, an electronic control unit for managing [[the]] a engine operation comprising data memories, and the system further comprising:

one or more neural networks;

input data representative of the engine operation and, optionally, of the vehicle movement, said data being available in the electronic control unit for managing the engine operation without adding a sensor; [[and]]

means for cumulating the estimated quantities; and

10 to 15 neurons.

Claim 2 (Cancelled).

Claim 3 (Currently Amended): The system as claimed in claim either of claims 1 and 2, further comprising training databases of the neural network, said databases being vehicle drive sequences of at least a few minutes.

Claim 4 (Currently Amended): The system as claimed in claim 1, wherein [[the]] data used at the input of the neural network or networks comprise at least one of the following parameters:

[[the]] an engine speed at two consecutive times t and t-Δt;

[[the]] a fuel flow rate at three consecutive times t, t-Δt and t-2Δt;

[[the]] an engine coolant temperature; and

[[the]] a vehicle speed at time t;

where Δt is the preset time interval between two consecutive measurement times and further comprising means for estimating at least the cumulative quantity of [[the]] soot in the exhaust gases which will be retained by the particulate filter.

Claim 5 (Currently Amended): The system as claimed in claim 1, wherein [[the]] data used at the input of the neural network or networks comprise at least one of the following parameters:

[[the]] an engine speed at two consecutive times t and t-Δt;

[[the]] a fuel flow rate at three consecutive times t, t-Δt and t-2Δt;

[[the]] an engine coolant temperature; and

[[the]] a fuel-air ratio of [[the]] a mixture at time t;

where Δt is the preset time interval between two consecutive measurement times and further comprising means for estimating at least the cumulative quantity of [[the]] soot in the exhaust gases which will be retained by a particulate filter.

Claim 6 (Currently Amended): The system as claimed in claim 1, adapted to an engine with common rail injection, wherein [[the]] a data used at the input of the neural network or networks at time t comprise at least one of the following parameters:

[[the]] a fuel preinjection rate in the engine;

[[the]] a main fuel injection rate in the engine;

[[the]] a relative displacement of a piston with respect to top dead center from the time when the last fuel injection in the piston cylinder started;

the relative displacement of a piston with respect to top dead center from the time when the last main fuel injection in the piston cylinder started;

the engine coolant temperature;

the engine air feed rate;

the pressure inside the common rail; and

the engine speed;

and wherein the estimated quantities of pollutant compounds comprise at least one of

the following quantities:

the cumulative quantity of the soot in the exhaust gases that will be retained by a

particulate filter;

the cumulative quantity of nitrogen oxides in the exhaust gases;

the cumulative quantity of the carbon oxides in the exhaust gases; and

the cumulative quantity of hydrocarbons in the exhaust gases.

Claim 7 (Currently Amended): ~~The system as claimed in claim 1,~~

A system for estimating quantities of pollutant compounds emitted in the exhaust

gases of a diesel engine of a motor vehicle, comprising means for regenerating a solid

particulate filter, an electronic control unit for managing the engine operation comprising

data memories, and further comprising:

one or more neural networks;

input data representative of the engine operation and, optionally, of the vehicle

movement, said data being available in the electronic control unit for managing the engine

operation without adding a sensor; and

means for cumulating the estimated quantities,

wherein no output from the system is looped to an input of the system to avoid any

problem of stability.

Claim 8 (Previously Presented): The system as claimed in claim 1, further comprising means for resetting the estimated quantities of particulates, independently of each other.

Claim 9 (Currently Amended): A method for evaluating ~~a system of claim 1,~~ a system for estimating quantities of pollutant compounds emitted in the exhaust gases of a diesel engine of a motor vehicle, comprising means for regenerating a solid particulate filter, an electronic control unit for managing the engine operation comprising data memories, and further comprising:

one or more neural networks;

input data representative of the engine operation and, optionally, of the vehicle movement, said data being available in the electronic control unit for managing the engine operation without adding a sensor; and

means for cumulating the estimated quantities,

said method comprising the step of:

evaluating the best configuration of the neural network or networks by calculating the error on the output quantities by cumulation on a sliding window.

Claim 10 (Previously Presented): The method as claimed in claim 9, comprising the step of determining the sliding window so that its size is minimal while allowing an estimation error lower than a preset value.

Claim 11 (Previously Presented): The method as claimed in claim 10, wherein the size of the window corresponding to a vehicle movement varies between 0.5 km and 1.5 km to allow an estimation error of not more than 5 g of solid particulates emitted per 135 km traveled by the vehicle.

Claim 12 (Previously Presented): The method as claimed in claim 9, comprising the step of discarding part of the data reserved for training the neural network or networks to perform a validation without the data used.

Claim 13 (Previously Presented): A method of controlling the means for regenerating the solid particulate filter of either claims 6 and 7, the method comprising the step of comparing the estimated quantity of cumulative soot with a memorized threshold value.

Claim 14 (Previously Presented): A method of calibrating engine control strategies comprising a step of estimating engine emissions over a vehicle drive cycle, wherein said estimating step is performed with the system as defined in claim 8.